Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.8, No.36, 2017
www.iiste.org

An Analysis of the Relationship Between Powerpoint Instruction and Students' Retention Score in Computer Science (Database Management System) in Colleges of Education in Rivers State

Leonard C. ANIGBO Ph. D
Department of Science & Computer Education
Enugu State University of Science & Technology (ESUT), Enugu State

Casmir U. EBUOH Ph. D
Department of Science & Computer Education
Enugu State University of Science & Technology (ESUT), Enugu State

Abstract
The study was conducted to investigate the effect of power point instruction on students' retention in computer science DBMs in colleges of education in Rivers State South-South of Nigerian. Two hypotheses guided the study. Four research assistants were trained and used for the study. The research assistants did the teaching and administered tests. COSAT were used for data collection. The instruments were validated by three experts, two from computer science and one in measurement and education. The internal consistency index was 0.79. The design of the study was a quasi-experimental study of pre-test and post-test, non-equivalent control group. Pre-COSAT and post-COSAT were administered few days before treatment begins. Treatment lasted for six/6 weeks, after treatment, both tests were reshuffled and administered as post-test COSAT. The research questions were answered using mean and standard deviation while the null hypotheses were analyzed using analysis of covariance (ANCOVA). The results of the analysis revealed that the experimental group obtained a higher mean retention score than the control group in the post-COSAT. The difference was significant. The male students also had higher mean retention scores than the female counterparts.
Keywords: PowerPoint Instruction, Retention Score, Colleges of Education, Computer Science & Data Base Management system.

Introduction

Since PowerPoint was developed over three decades ago, the Microsoft slide presentation program has become ubiquitous in meetings and college lectures (Cornel, 2014). It has become a basic means of delivering lecture instructions in educational centers around the globe. There has been general opinion amongst academics and students that the use of powerpoint presentations improves students retention ability.

Retention is the act of retaining or an ability to recall or recognize what has been learnt or experienced over a long period of time. Probably, if what has been learnt is retained over a long period of time, it may lead to higher achievement because retention is measured in collaboration with achievement (Iji, 2010). Therefore, Iji (2010) argued that retention is a crucial construct that most classroom teachers strive to maximize among their students. Summerskill (2002) showed that within each type of institution, institutional retention rates varied from 18 percent to 88 percent. He also alluded to the necessity of a standard formula for measuring retention so that the reported rates could be accurately compared. Four decades later, a standard formula has not yet been universally accepted. On this note, Ukeje and Obioma (2002), and Ogbu (2015) in their separate researches all made crucial points for the adoption of teaching methods that enhance students achievement, involvement and activity in the teaching of secondary and tertiary school subjects or courses so as to improve students retentiveness. One of these teaching methods may be the use of Microsoft Office PowerPoint (MOPP) in teaching computer science in tertiary schools. The presence of the Microsoft PowerPoint Instruction Strategy when fully adopt is expected to a large extent improve students achievement and retention in computer science in higher institutions.

MOPP is a slide show presentation programme currently developed by Microsoft incorporation. PowerPoint is a highly innovative and versatile programme that can ensure a successful communication whether you are presenting in simply front potential investors, a lecture theatre, a classroom or simply in front of your colleagues. There are various versions of MOPP. The latest version is PowerPoint 2016 (Version 16; Office 2016).

According to Ogbu (2015), students who offer computer science in tertiary institutions including colleges of education do not achieve well in computer science education and other science education courses. It is surprising to observe that some third and final year students in various tertiary institutions including colleges of education in computer science have many carryover courses in first and second year courses in computer science (Ejimaji, Ordua and Bella, 2015). This calls for the need to search out means of helping computer science education students in colleges of education in enhancing their retention capability. More so, there has been a popular

debate on genders issues in relation to lecture retention and achievement

Gender issues and academic achievement has become a very important issue among researchers. According to Nworgu (2004), there is an acknowledged problem of female underachievement when compared with their male counterparts apparently under equivalent conditions and this problem of female under achievement appear to be more pronounced in science and mathematics. The term "gender" refers to socially ascribed roles, responsibilities and opportunities associated with women and men, as well as the hidden power structures that govern relationships between them. Gender is in essence, a term used to emphasize that sex inequality is not caused by the anatomic and physiological differences that characterize men and women, but rather by the unequal and inequitable treatment socially accorded to them (Igwe, 2003). In this sense, gender alludes to the cultural, social, economic and political conditions that are the basis of certain standards, values and behavioural patterns related to genders and their relationship. Gender is the different socio cultural stereotyped roles and responsibilities expected of men and women.

According to Eze (2008) gender is a parallel and socially unequal division into masculinity and femininity. Biases and misconceptions about women and science is that, science is a male enterprise and this has remained the main focus of concern among science educators. In Nigeria, gender bias is still prevalent; it has persisted even within the science classroom. According to Igwe (2003) gender issue is an important factor in educational setting and could be a hindrance to high achievement of learners in sciences. Some factors have been identified to account for differences in male and female achievement in science subjects. Prominent among the factors identified by Okeke (1990) is sex role stereotyping which seems to be the origin of differences between male and female achievement in science education. Some research works have shown contradictory evidences in students' academic achievement in sciences due to gender. For instance, Olikeze (1999) and Ifeakor (2005) found out that there is no significant difference in the achievement of males and females in biology and chemistry respectively. It is therefore, worthwhile to see how MOPPP would bridge the gap in science achievement between male and female students in Computer Science Education. Therefore, this study intends to find out the effect of powerpoint instruction on students' retention score in computer science (database management system) in colleges of education in Rivers State, Nigeria with a view to determining students' mean retention score in computer science (Database Management System) when taught with Microsoft PowerPoint Instruction Strategy and lecture method, and ascertaining male and female students mean retention score in computer science (Database Management System) when taught with Microsoft PowerPoint Instruction Strategy and lecture method.

Research Hypothesis

The following hypotheses guided this study:

$H0_1$: There is no significant difference between the mean retention scores of students taught DBMS with Microsoft PowerPoint and that of those taught with lecture method.

$H0_2$: There is no significant difference between the mean retention scores of male and female students taught DBMS with Microsoft PowerPoint and that of those taught with lecture method.

Methods

This is a quasi-experimental study of the effect of Microsoft PowerPoint instruction on students' achievement. Specifically, the study was a non –equivalent control group design. This design is deemed appropriate because, the study involved the use of intact classes in which there was no random assignment of the subjects to experimental and control groups (Best, 2000). The design is represented schematically as follows:

Schematic Representation of Pre-test Post –test Control Group Design

Group	Pre-test	Treatment	Post-test
Experimental (E)	O_{E_1}	$P_E O_{E_2}$	
Control (C)	O_{C_1}	$P_C O_{C_2}$	

Where:

O_{E_1} =Pre-Basic Computer Achievement Test For experimental Group

O_{E_2} =Post –Basic Computer Achievement Test For experimental Group

O_{C_1} =Pre-Basic Computer Achievement Test For control Group.

O_{C_2} =Post-Basic Computer Achievement Test For control Group

P_E = Microsoft PowerPoint Instruction

P_C = Lecture Method

Lecture method was used as control. According to Nworgu (2004), an essential and indispensable feature of quasi-experimental design was the use of control. He opined that a control group is one to which the experimental treatment was not administered. The study was conducted in Colleges of Education in Rivers State. In the state there are two colleges of Education namely College of Education Rumuolemini Port Harcourt which is state owned and Federal College of Education (Technical) Omoku. The rational for this choice is based on the fact that, they are located in areas with good facilities like electricity laboratories which are prerequisite for the experiment. Also, students in these areas achieve poorly in Computer Science Education. The Population for the study consists of all 346 two hundred Level students in the two Colleges of Education in River State.

The researcher used all the three hundred and forty six (346) two hundred level computer science Education students from two Colleges of Education in the State. There was no sampling, since the entire population is manageable. According to Nwanna (2007), the entire population could be studied when the size of the population is considered small. The instrument for data collection for the study was Computer Science Achievement Test (COSAT). COSAT which was developed by the researcher using Computer Science scheme of work of two hundred Level students. It consists of two sections: section A contains information on the personal data of the research course and section B consists of instructions for the test and 40 multiple choice questions. The 40 items were drawn from the contents spelt out in the table of specification. Each item has four response options a, b, c, and d. The instrument served as Pre-test and Post-test. For the Post-test, the Pre-test items were reshuffled without altering the options. The instrument was validated by three experts (two from the Department of Science and Computer Education, ESUT and one from Department of Computer Science Education, Federal College of Education, Omoku Rivers State). An estimate of internal consistency for the COSAT was determined using Kuder-Richardson formula (K-R_{20}).The use of this form of reliability estimate was considered appropriate since the test items were dichotomously scored (Uzoagulu, 2014).yielding an internal consistency index of 0.79. The COSAT was administered to both students groups as (pretest), three days before the treatments. Sixty minutes was allowed for the test. The tests enable the researcher to determine the prior knowledge and achievement of the students. At the end of the treatment which lasted for six weeks, the pretest items were reshuffled and given to the two groups again as post-tests. One mark each was assigned to the test items in the pre-COSAT and post-COSAT.

The 40 items pre-test, posttest- was scored one mark each. The maximum mark were 40 and lowest zero. The scores for both experimental and control groups were recorded accordingly. The researcher used mean and standard deviation to answer the research questions. Mean score was used because it is the most reliable measure of central tendency (Uzoagulu 2014). The hypotheses formulated for the study was tested at 0.05 level of significance, using Analysis of covariance (ANCOVA). This is because, Analysis of Covariance is the most appropriate statistical tool for analyzing data based on pre-test, post- test design since it takes care of initial differences in the ability levels of the tests (Uzoagulu, 2014).

Results

Table 1: Analysis of covariance (ANCOVA) result of posttest retention score of computer students taught with Microsoft power point instruction strategy and lecture method.

Tests of Between-Subjects Effects

Source	Sum of Squares	Df	Mean Square	F	Sig. (p>.05)
Corrected Model 307.910[a]	7	30.791	1.102	.381	
Intercept	2308.803	1	2308.803	20 8.076	.000.
(Main effect) Method	178.256	1 0	17.826.	.312	.022
Gender	3,671	1	3.671	.033	.085
Method *Gender	.62.632	1	62.632	1.521	.223
Error	2223.296	324	41.172		
Total	71026.000	346			
Corrected Total	2285.929	345			

a. R Squared = .197 (Adjusted R Squared = -.018)

As shown in table 1. The calculated probability value 0.022 of the main effect is less than the alpha level of 0.05 which is the standard for this study. Therefore the null hypothesis 1 is not accepted. This implies that there exist significant difference between the mean retention scores or levels of students taught DBMS with Microsoft power point and that of those taught with lecture method in Computer Science.

H_{02}: There is no significant different between the mean retention scores of male and female students taught DBMS with Microsoft power point and that of those taught with lecture method.

Table 2: Analysis of Covariance (ANCOVA) Result of Male and Female Retention in Experiment and Control Students taught with Microsoft PowerPoint Instruction Strategy and lecture Method.

Tests of Between-Subjects Effects

Source	Sum of Squares	Df	Mean Square	F	Sig. (p>.05)
Corrected Model	203.671[a]	11	18.516	2.058	.045
Intercept	2133.792	12	133.792	237.159	.000.
(Main effect) Gender	203.3000	10	20.330	2.260	.041
Method *Gender	4.080	4	4.080	.453	.035
Error	1369.194	320	31.118		
Total	63111.000	346			
Corrected Total	1564.839	345			

a. R Squared = .340 (Adjusted R Squared = .175)

As shown in table 2. The calculated probability value 0.041 of the main effect is less than the alpha level of 0.05 which was the bench mark set for this study. Therefore hypothesis 2 is rejected. This is an indication that there exist significant difference between the mean retention scores of students taught DBMS with Microsoft power point and that of those taught with lecture method in computer science.

Discussions

Effect of DBMS on students' retention: The finding showed that the experiment group obtained a higher mean retention score than the control group in computer Microsoft power point instruction strategy. The different was significant. The findings lend credence to the work of Akcay (2002), Norrie (2008) who found out in their individual study that DBMS learner in experiment method enhance retention. The fact that DBMS helped students' retention may be because it was activity or practical oriented and student learnt computer science theory, combined with day to day life experience. Student tends to learn with great interest and retain more when teaching and learning was student centered experimentally.

The study also revealed the effect of gender on students' retention in DBMS Microsoft office power point instruction strategy and lecture taught. The male student had higher mean retention score than female counterpart. The difference was significant. The findings were in agreement with the findings of Aniodoh (2001) who found out that there was a significant difference in the retention rate of male and female students in computer science subject. The study was also in agreement with Robert (2002) who found that significant difference in the retention of male and female cannot be over emphasized. The reasons for this result might be because the experimented group practicalised and comprehended the process more than the females.

Conclusion

The uses of PowerPoint presentations in classroom instruction have gained global attention.
The effect on teaching computer science in students' retention ability in the colleges of education in Rivers State has been significant. From the study it had been found that DBMS in computer science MSPPIS is better than the lecture method. The study found out that the mean retention scores of male was also significant. This study therefore recommends that the use of powerpoint presentation as an academic instructional material in Colleges of Education in Rivers State, Nigeria should be encouraged.

References

Akcay, H., (2002). An Example to the Effect of Computer Assisted Science Instruction on Students' Success and their Attitude. *The Turkish Online Journal of Educational Technology (TOJET) Article 9*.

Aniodoh, H. (2001) Stimulating and Sustaining Interest in Chemistry. Journal of Science and Computer Education 1 (1):236-241.

Best, R., (2000). Research on the Uses of Technology in Science Education.D.L. Gabel (Ed), *HandbookofResearch on Science Teaching and Learning* (177-210). New York: Simon and Schuster McMillan.

Cornel, L. (2014). What is the impact of powerpoint lectures on learning? A brief review of research. Retrieved from http://www.hagerstowncc.edu/sites/default/files/documents/14-fletcher-powerpoint-research-review.pdf on 01/08/2017

Ejimaji, E.U., Ordua, V.N. and Bella, D. (2015).Information and Communication Technology (ICT) and the Implementation of Universal Basic Education programmes.

Eze, S.A (2008). The Relationship between Science Teachers' Perceived Self Efficacy and Job Performance. *Journal of Educational Research, Faculty of education, UNN 8:* 162-170.

Ifeakor AC (2005). Effect of commercially produced computer assisted instruction package on students' achievement and interest in chemistry. Unpublished Ph.D Thesis. University of Nigeria, Nsukka.

Igwe, I.T. (2003). Enriching Science Education: The Place of Improvisation in Classroom.*Science Teachers Association of Nigeria (STAN) 41st Annual Conference Proceedings. 51-53*

Iji, C.O. (2010). Approach to Secondary School Geometry. *Journal of Science Teacher Association of Nigeria,* 3(2): 45-50.

Norrie (2008) Non formal education and adult learners: An overview. In B.A.Ogoro and R.N. Oranu (Ed). Methodology in formal and non-formal technical/vocational education. Enugu: Ijejas Printers and Publishers Company.

Nwanna, O.C. (2007). *Introduction to Educational Research*.Ibadan Heinemann Educational Publisher Ltd.

Nworgu, L.N. (2004). Effects of Gender Sensitization of Science Teachers on Gender Gap in Science Achievement and Interest among Students.*Unpublished Ph. Dissertation.Nsukka: University of Nigeria.*

Ogbu, S. (2015). *Effect of Microsoft Excel on Secondary School students Achievement, interest and Retention in Mathematics in Enugu Education Zone. Ph.D Thesis* Dept. of Science & Computer Education, ESUT, Enugu.

Okeke (1990). Improving introductory technology teaching in Nigeria. Audio-visual association. Obafemi Awolowo university, Ile-Ife

Okeke, E.A.C (2001). *Women in Science, Technology and Mathematics Education in Nigeria.*In Nzewi, U.M. (2010) It's all in the Brain: of Gender and Achievement in Science and Technology Education Nsukka, University of Nigeria Senate Ceremonials Committee.

Olikeze FC (1999). Effects of computer-assisted instruction on Secondary School Students cognitive achievement and interest in Biology. Unpublished Ph.D. Thesis. University of Nigeria, Nsukka.

Robert (2002) Developing a computer assisted tutorial: A beginner's experience. Accessed April 3, 2009 from http://www.acet.org

Ukeje, B.O. & Obioma, G.O. (2002). Mathematical Games for Primary and Secondary Schools. Abuja: National Mathematical Centre, Sheda, Nigeria.

Uzoagulu, A.E. (2014). *Practical Guide to writing Research Projects In Tertiary Institutions*. Enugu: John Jacob's Classic Publishers Limited.